

## SECTION 07840

### FIRESTOPPING

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#### **LANL MASTER CONSTRUCTION SPECIFICATION**

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the Engineering Standards Manual (ESM) Fire Protection POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

Specification developed for ML-3 / ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

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This section includes products for closing openings in and penetrations through fire rated construction to maintain fire and smoke resistance ratings.

This section describes single and multiple component silicone elastomeric compounds, foam compounds, formulated compounds mixed with incombustible non-asbestos fibers, composite systems based on mineral fiber stuffing insulation, and mechanical devices with incombustible fillers.

Mechanical and electrical specification sections may specify firestopping products. Coordinate with mechanical and electrical work that reference products of this section.

Manufacturers listed in this section were identified by Architects' First Source, Inc. (AFS) as representative and not as an endorsement for meeting this specification. For additional acceptable manufacturers, refer to the Underwriters Laboratories Fire Resistance Directory for Through-Penetration Fire Stop Systems.

This section includes performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements.

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#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Firestopping materials, accessories, and installation for sealing penetrations through fire rated barriers, firestopping tops of fire rated walls, and sealing penetrations/joints through barriers where smoke sealing is required. This section does not include fire/smoke dampers or fire doors.
- B. Related Sections:
  - 1. Section 09260 - Gypsum Board Assemblies: Gypsum board fireproofing.
  - 2. Division 15 - Mechanical: Mechanical work requiring firestopping.
  - 3. Division 16 - Electrical: Electrical work requiring firestopping.

## 1.2 REFERENCES

- A. ASTM International:
  - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- B. Underwriters Laboratories Inc.:
  - 1. UL 263 - Fire Tests of Building Construction and Materials.
  - 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
  - 3. UL 1479 - Fire Tests of Through-Penetration Firestops.
  - 4. UL - Fire Resistance Directory.
- C. Factory Mutual Research Approval Guide
  - 1. Wall and Floor Penetration Fire Stops.
- D. Warnock Hersey:
  - 1. WH - Certification Listings.

## 1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Fire Stop System): An assembly of one or more materials, placed in an opening through a fire-rated barrier to arrest movement of fire, smoke, heat, and hot gases through the fire-rated barrier, to maintain the fire-resistant integrity of the fire-rated barrier in which it is installed.
- B. Smoke Seal: A firestopping assembly of at least 1/2 hour fire rating. The International Building Code requires smoke seals as a minimum between stories in multi-story buildings.

## 1.4 PERFORMANCE REQUIREMENTS

- A. Through-penetration fire stop systems shall have been tested in accordance with ASTM E814 or ANSI/UL 1479 to achieve fire ratings of adjacent construction [shown on the Drawings] [noted in Schedule at end of this section.]
- B. Through-penetration fire stop systems shall be Listed by Underwriters Laboratories or Warnock-Hersey, or Approved by Factory Mutual.
- C. Through-penetration fire stop systems shall conform to applicable requirements for flame spread and smoke developed ratings.

- D. The following UL listed penetration seal designs are suggested but not intended to be all inclusive. (Note: Submittal requirements per Section 1.5 apply regardless of which seal designs are used.)

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Note: Titles below link to [www.us.hilti.com](http://www.us.hilti.com) as a convenience; this is not intended to limit use of other products allowed by this Section.

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UL Drawing	Subject
C-AJ-1291	<a href="#">Steel, cast iron, copper, conduit or EMT</a>
C-AJ-2220	<a href="#">Max. 2" PVC, CPVC, FRPP or ABS (closed or open)</a>
C-AJ-4017	<a href="#">Cable trays (steel or aluminum)</a>
C-AJ-5091	<a href="#">Steel or copper w/glass fiber insulation (sleeved or unsleeved)</a>
C-AJ-7051	<a href="#">Metal duct without damper</a>
C-AJ-8041	<a href="#">Multiple insulated and non-insulated steel, copper, conduit or EMT</a>
C-AJ-8056	<a href="#">Multiple insulated and non-insulated steel, copper, EMT, cables and cable trays</a>
W-J-2071	<a href="#">Max. 2" PVC or CPVC (closed system only)</a>
W-J-3036	<a href="#">Single or multiple cables (sleeved or unsleeved)</a>
W-J-3060	<a href="#">Cable bundle (various cables)(sleeved).</a>
W-J-5057	<a href="#">Max. 10" steel pipe with max. 3" thick glass-fiber insulation</a>
W-L-1164	<a href="#">Steel, copper, conduit or EMT (sleeved)</a>
W-L-1176	<a href="#">Max. 2" EMT or steel conduits.</a>
W-L-2098	<a href="#">Max. 2" PVC or CPVC (closed system only)</a>
W-L-2165	<a href="#">Max. 2" Fiber Optic Raceway (innerduct) or ENT pipe.</a>
W-L-3111	<a href="#">Single or multiple cables (sleeved or unsleeved)</a>
W-L-4019	<a href="#">Spine cable trays (steel or aluminum)</a>
W-L-5028	<a href="#">Max 4" steel, conduit, EMT or max 2" copper with max 3/4" AB/ PVC insulation</a>
W-L-5029	<a href="#">Steel, copper, conduit or EMT w/glass fiber insulation</a>
W-L-7040	<a href="#">Metal duct without damper</a>
W-L-8004	<a href="#">Multiple cables, EMT, and PVC (closed)</a>

## 1.5 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
1. Product Data: Submit data on product characteristics, performance and limitation criteria.
  2. Engineering Judgements: For conditions not covered by UL or FM or WH listed designs, submit proposed system design, evaluation and judgment by the product manufacturer's engineering department or a licensed professional engineer suitable for presentation to authority having jurisdiction (LANL Fire Marshal) for acceptance as meeting code fire protection requirements.
  3. Schedule: Submit schedule of opening locations and sizes, penetrating items, and required Listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
  4. Manufacturer's Installation Instructions: Submit standard detail for each different typical type of firestopping application. Submit preparation and installation instructions.

## 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. For new buildings and major additions [including this Contract], firestopping shall be installed by a single subcontractor specializing in firestopping regardless of craft responsible for penetration. Installer shall be a company that has been appropriately trained by the manufacturer to install products specified in this section [having [3] years experience (both Company and technicians) installing similar products in similar locations].

## 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Where multi-component foams are used, do not apply materials when temperature of substrate material and ambient air is below 60 degrees F (15 degrees C), or as specified by the manufacturer. Maintain this minimum temperature before, during, and for minimum 3 days after installation of materials, or as specified by the manufacturer.
- B. [Provide appropriate ventilation in areas to receive solvent cured materials.]

## PART 2 PRODUCTS

### 2.8 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

### 2.9 FIRESTOPPING

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In this article, list manufacturers acceptable for this Project.

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- A. Manufacturers: Any manufacturers of firestopping products are acceptable, as long as the proposed through-penetration fire stop system provided by the manufacturer is Listed by Underwriters Laboratories or Warnock-Hersey, or Approved by Factory Mutual. The following manufacturers are among those with approved through-penetration fire stop systems. This list is not all-inclusive.
  - 1. [Dow Corning Corp.]
  - 2. [Hilti Corp.]
  - 3. [3M Fire Protection Products]
  - 4. Specified Technologies, Inc.
  - 5. [Others per Section 01630, Product Options and Substitutions.]

- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.

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Include this paragraph only where visible color is of concern. Final cured color of firestopping material can also be indicator as to correct mix formulation and expected performance of material.

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- C. Color: [Dark gray] [Black] [As selected from manufacturer's full range of colors].

## 2.10 ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Dam Material: Where a dam material will be a permanent part of the installation, use dam material as required by the manufacturer. Where there manufacturer does not specify a dam material, use one of the following as appropriate:
  - 1. Mineral fiberboard.
  - 2. Mineral fiber matting.
  - 3. Sheet metal.
  - 4. Alumina silicate fire board.
- C. Installation Accessories: Provide clips, straps, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- D. Labels: Red and white self-adhesive label, or plastic or metal plate. As a minimum stating the installation is a "fire rated assembly" or "through-penetration fire stop system," and installation data (UL-Listed or FM-Approved configuration number, date installed, installer and organization). Also state "Modify/remove only with LANL Fire Group approval" if space permits. Examples of acceptable products:
  - 1. Hilti sticker P/N 00339611
  - 2. Hilti plate P/N 00306219

## PART 3 EXECUTION

### 3.11 EXAMINATION

- A. Verify openings are ready to receive firestopping (items penetrating the opening have been installed, opening is appropriately sized to allow use of the proposed firestopping system, etc.).
- B. After firestoppping installation and at least 5 days before covering up the installation (with gypsum board etc), notify LANL Construction Inspector so that inspection can occur.

### 3.12 PREPARATION

- A. Protect adjacent surfaces from damage.

- B. Clean substrate surfaces of dirt, dust, grease, oil, loose material.

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Include this paragraph only where a bond is required between the seal material and the opening.

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- C. Remove incompatible materials that could affect the bond between the seal material and the opening.
- D. Install damming materials per manufacturer's instructions.

### 3.13 APPLICATION

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, raceway, conduit and other items requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in accordance with manufacturer's instructions to achieve required fire rating.
- D. Place foamed material gradually and per manufacturer's instructions to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- E. If firestopping material requires installation of a dam as part of installation of the firestopping material, remove the dam material following installation only if permitted by manufacturer's instructions.
- F. Where air ducts pass through walls, floors, or partitions that are required to have a fire resistance rating **and where fire dampers are not required**, the opening in the construction around the air duct shall be as follows:
  - 1. Not exceeding a 1-in. (2.54-cm) average clearance on all sides
  - 2. Filled solid with an approved through-penetration fire stop assembly material capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste when subjected to the time-temperature fire conditions required for fire barrier penetration as specified in, NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials

### 3.14 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications, submitted schedule, and manufacturer's instructions for the installed seal configuration.

### 3.15 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

### 3.16 LABELING

- A. LABEL FIRE barriers (wall/floor) to indicate fire barriers (ex., "Two-hour fire-rated wall"). Labels shall be frequent and visible enough that future activities requiring penetration of the fire barrier will recognize the need for firestopping.

- B. Label fire barrier penetration seals on both sides of the penetrated fire barrier. Provide labels per Part 2.

### 3.17 SCHEDULES

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Include schedule when listing or scheduling items of this section that require two or more firestopping types or fire ratings. When Drawing schedule is used, delete this article.

Consider the following examples when developing Project schedule.

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LOCATION	UL/FM/WH #	FIRE RATING
Main floor fire walls	xxx	1 hour
Stair walls	xxx	2 hours
Room to room partitions, metallic pipe and conduit	xxx	3/4 hour
Room to room partitions, non-metallic pipe and conduit	xxx	3/4 hour
Floors, metallic pipe and conduit	xxx	1 hour

END OF SECTION

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Do not delete the following reference information:

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FOR LANL USE ONLY

This project specification is based on LANL Master Construction Specification Rev. 0, dated November 24, 2003